INTRODUCTION

The City of Burbank Building Division sponsors the Student Design Competition each year in collaboration with Burbank Water and Power and the Burbank Recycle Center to provide an opportunity for high school students in the City to creatively explore the areas of building design, site planning, transportation, community services and redevelopment. This is the eleventh year of the contest.

The sponsors of the competition comprise professionals who have many years of experience and understanding in architecture and construction. The contest is an ideal opportunity for students to interact with City staff in order to gain knowledge of and exposure to design, construction, and basic City operations.

The competition focuses on the fields of architecture and design but is not limited to students interested in only those subjects. Students with interests in art, photography, environment issues, graphic design, urban planning, government, construction and computer design are encouraged to participate. A wide range of media may be used to solve the design problem in creative ways.

The project focuses on design of a dwelling unit in a different topographical setting each year. Working with a house design encourages creative thinking about a familiar use and building type. It requires analyzing climate, materials, site circulation, relationships between functions, massing of building forms, materials, and aesthetics.

Even though building code standards and restrictions regulate how a building can be built, these restrictions will not apply to this project. This competition will be an exercise in creative expression of building design and site use. Since a dwelling can be a very personal reflection of who the inhabitants are and the aesthetic preference of the designer, the project program has been left open to the discretion and creativity of the designer. Participants may enter as individuals or as a team.

IMPORTANT DATES:

April 1, 2014	PROJECT SUBMITTAL DEADLINE. (In order to be fair to all applicants, no extensions can be given.)
April 14-18, 2014	Announcement of awards
April/May 2014	City Council Presentation (Exact date to be determined pending Council's calendar).

AWARDS:

A panel from the Burbank community including architects, council members and representatives from the creative industry will judge based on their interpretation of a project's:

- Design and creativity: How unique is the solution?
- Presentation quality and workmanship: How clear are the presentation boards and model?
- Program: Does the project fulfill the program and environmental requirements?

The Burbank Water & Power-Recycle Center Environmental Scholarship is awarded based on creativity, the overall design and use of environmentally beneficial features such recycled materials and water conservation. Also, is the house an energy efficient building that addresses the solar orientation, cooling/heating needs, and wind/sun protection?

First Place	$1,500 per team
Second Place	$1,000 per team
Third Place	$ 500 per team

The winners will be recognized at a Tuesday night meeting of the City Council in April/May 2014.

THIS YEAR'S PROGRAM

In the 1900s, Burbank was home to many aviation companies such as Lockheed that were operating at the cutting edge of technology at the time. Since aviation expanded to outer space in the 1960s, space exploration has progressed from unmanned space crafts to potential settlement of planets by astronauts. The theme of this year's contest is Space Design, as in outer space. An organization called Mars One is planning the first human settlement on Mars. The departure of the first crew of four explorers is expected to take place in 2024. Mars One's website says,

> It is Mars One's goal to establish a human settlement on Mars. Human settlement of Mars is the next giant leap for humankind. Exploring the solar system as a united humanity will bring us all closer together. Mars is the stepping stone of the human race on its voyage into the universe. Human settlement on Mars will aid our understanding of the origins of the solar system, the origins of life and our place in the universe. As with the Apollo Moon landings, a human mission to Mars will inspire generations to believe that all things are possible, anything can be achieved. - See more at: http://www.mars-one.com/mission#sthash.p5SfWile.dpuf

As a space designer, what would you design to meet the specific needs of Mars colony inhabitants?

- The settlement will have to be completely self-sufficient in terms of food, water, air, material resources and recycling of waste. Mars One plans to use solar panels for energy and inflatable living units. Photos of moon bases and extraterrestrial settlements begin on Page 11.
- Figure A in this program shows a plan view of a hypothetical lot for the settlement with dimensions and topography that can be used as reference in determining where the based be located on the site.
- Figures B and C show examples of cuts through the site and give possible locations for the base, but placement is not limited to only these locations.
- The structures may be located on the flat part of the lot, nestled into the slope or cantilevered on columns.

PROJECT REQUIREMENTS

1. There is no restriction on the number, size or use of rooms. The living quarters should be large enough to accommodate an efficient living/sleeping space, bathroom, and kitchenette.

2. There is no specific monetary budget for the design and construction.

3. In order to qualify for the Environmental Scholarship, the project needs to include at least three Environmental Features: 1. Recycling, 2. Water conservation and 3. Energy efficiency. See Page 8 for information on how to show these features on the plans.

4. Write a brief one paragraph description of your design, highlighting any unique features. Also mention the environmental features from Number 3 above and include a sentence that "the settlement addresses recycling, water conservation, and energy efficiency." Attach this narrative to your presentation board.

5. Be creative!

The final presentation and submittal should show how the living quarters will function based on the location of rooms, travel through the interior space, and the relationship between the spaces inside and exterior design of the structure. This can be achieved by any or all of the following methods:

- Hand drafted or computer generated floor plans and exterior elevations, drawn to scale
- Supporting photos or magazine cut outs of building elements that would apply to the design,
- Perspective drawings or renderings of the base using pencil, marker, paint, charcoals, pastels or as a collage of materials used in either an abstract or realistic way.
- A foam board or cardboard model that shows the shape and massing of the settlement, window and door openings, and the roof line. The model does not have to show the interior furniture layout.

SUBMITTAL MATERIALS

This is the list of the actual items required for submittal. Examples of each item are provided on the next page. EACH PARTICIPANT WILL TURN IN ONE PRESENTATION BOARD AND ONE MODEL.

1. Presentation Board: made of foam board or cardboard. Most students use either a 24" x 36" tri-fold presentation board or 32" x 40" foam core boards. These can be purchased from Michaels, Aaron Brothers or an art supply store. Samples of board layouts are shown on pages 6 - 7. On the board, include the following drawings and information:
    - FLOOR PLAN(S) of the house with notation of three environmental features – use of recycled materials, rainwater harvesting and composting. See page 8 for more help on how to draw the environmental features on the plans and model.
    - ELEVATIONS of the house from two sides - the front as seen looking toward the hill and one side. The front view of the house can be labeled FRONT VIEW ELEVATION. The side view of the house can be labeled SIDE VIEW ELEVATION. You may redraw or superimpose your drawings on the sections shown in Figures B and C on page 5.
    - SITE PLAN: Using Figure A on page 4, outline and shade in the area where the house will be located on the site and attach it to your presentation board. Label this drawing as SITE PLAN.
    - NARRATIVE: A one paragraph description explaining your design and any unique features. Also mention the environmental features. Attach this narrative to your presentation board.

2. Model: A foam core or cardboard physical model of the house situated on its site. The model should be mounted on a sturdy cardboard or foam board. See sample on page 7. The model may be any size of the designer's choosing but does not need to be bigger than a 24" x 36" presentation board. *Applicants may receive assistance from those outside of the school faculty such as an architect, or engineer, but this person's name must be included on the application form as an Advisor.*

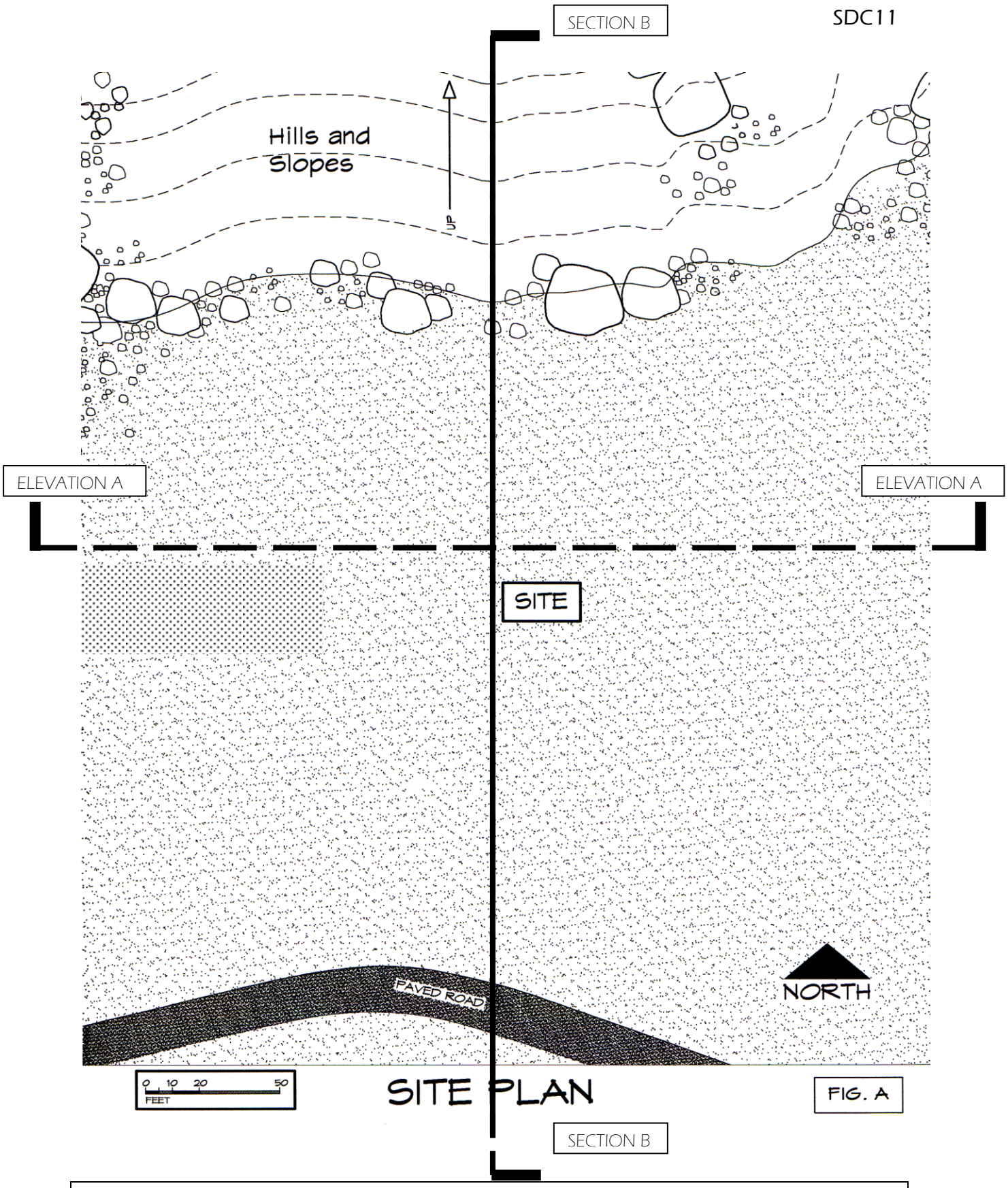


FIGURE A PROVIDE AN OUTLINE OF YOUR HOUSE ON A REPRODUCTION OF THE SITE PLAN ON THE PREVIOUS PAGE AND ATTACH TO PRESENTATION BOARD

ELEVATION A

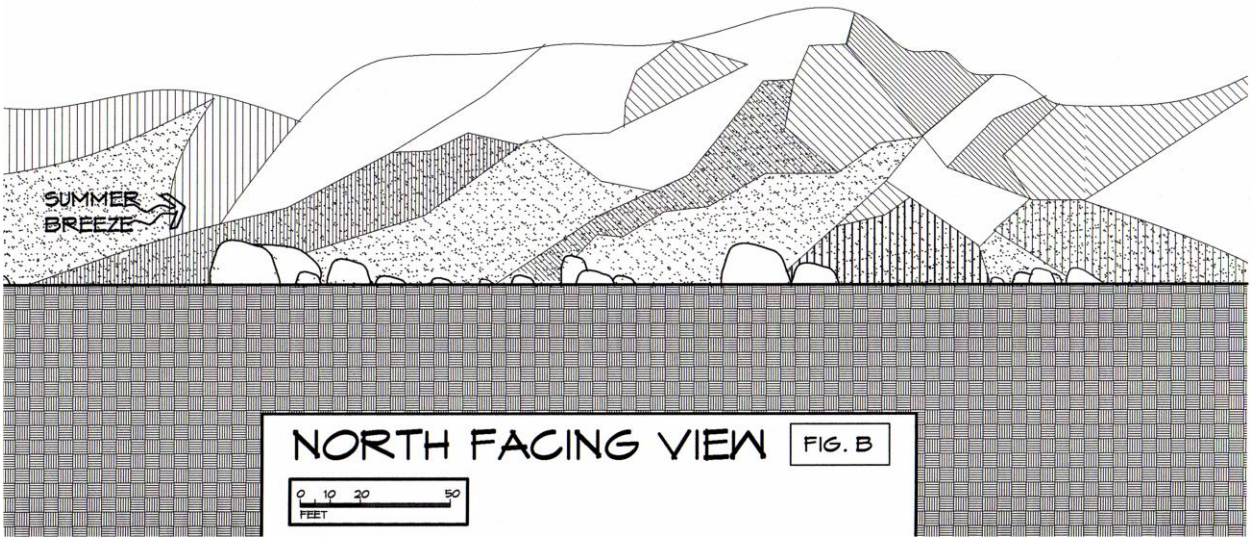


FIGURE B – *USE THIS ELEVATION AS A BACKDROP FOR YOUR HOUSE. BY SHOWING A THE FAÇADE SUPERIMPOSED ON THIS VIEW. ATTACH TO PRESENTATION BOARD.*

SECTION B-B

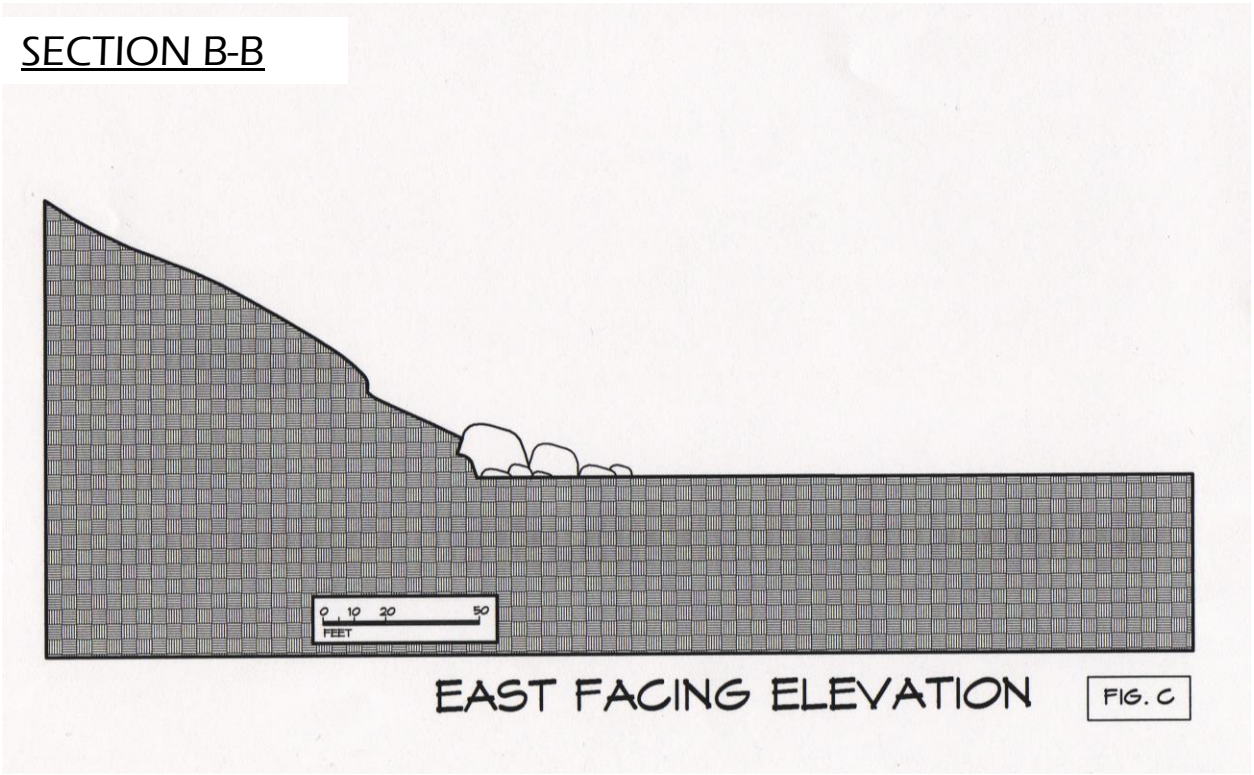
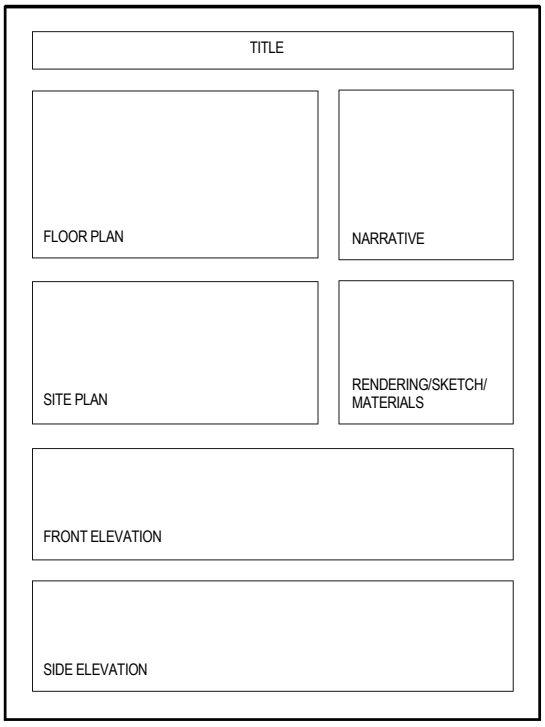
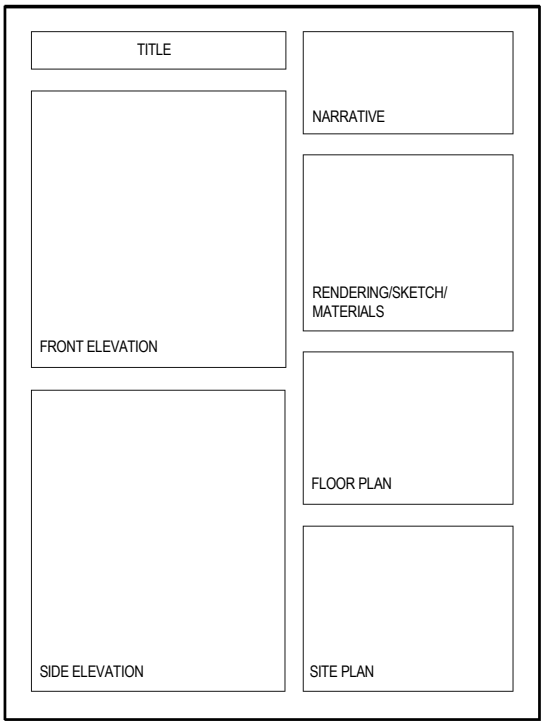
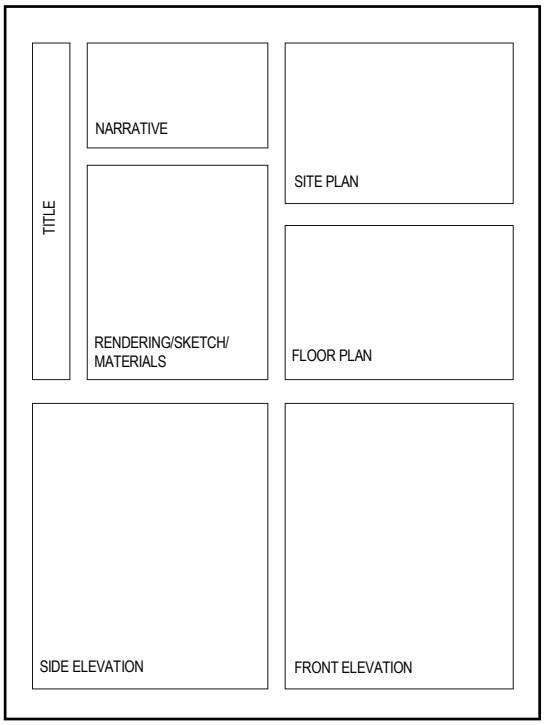


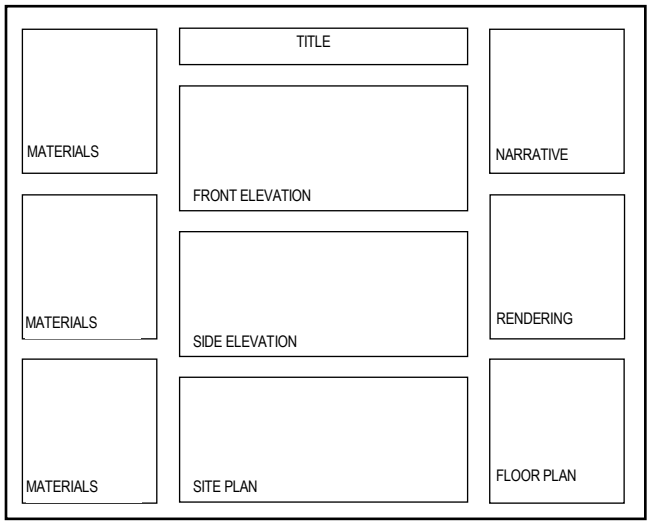
FIGURE C – *SUPERIMPOSE A SIDE VIEW OR SECTION OF YOUR HOUSE ON THIS BACKGROUND AND ATTACH TO YOUR PRESENTATION BOARD.*

FIGURE D. SAMPLE PRESENTATION BOARD LAYOUTS



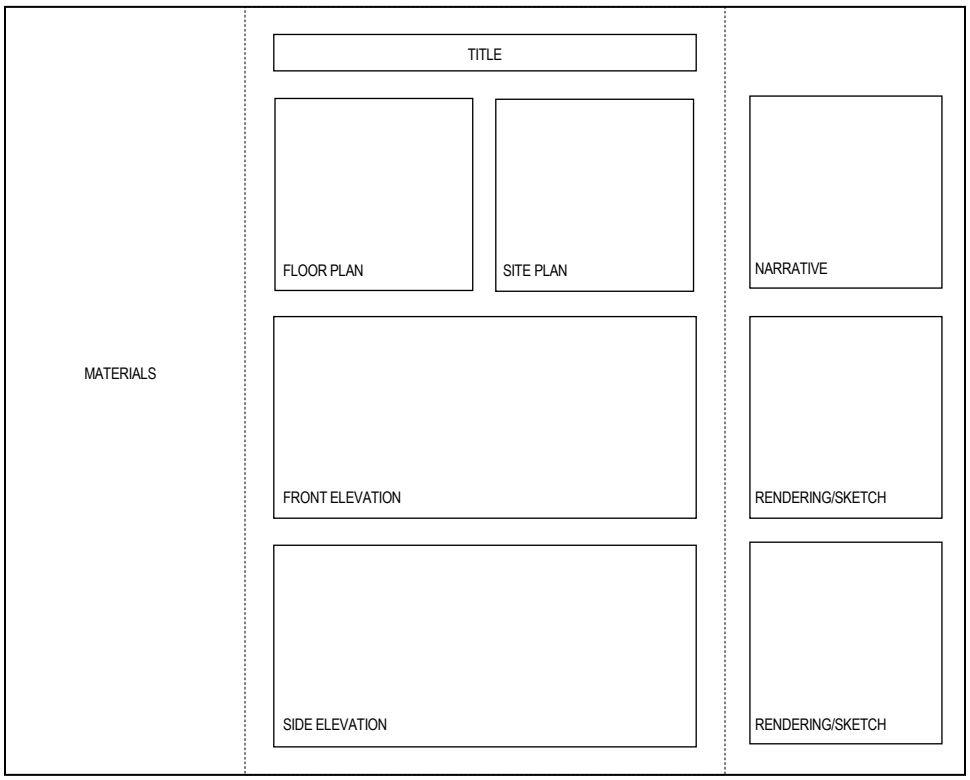




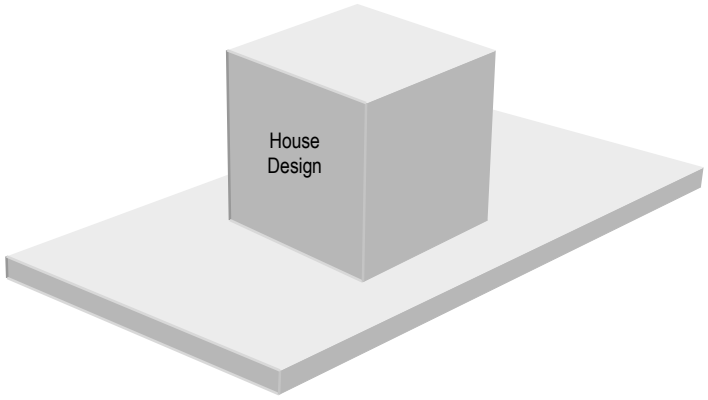


EXAMPLE OF 32" X 40" SINGLE BOARD

EXAMPLES OF SINGLE BOARDS



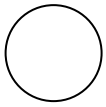
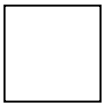
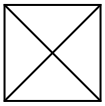
EXAMPLE OF TRI-FOLD BOARD LAYOUT



EXAMPLE OF MODEL BASE

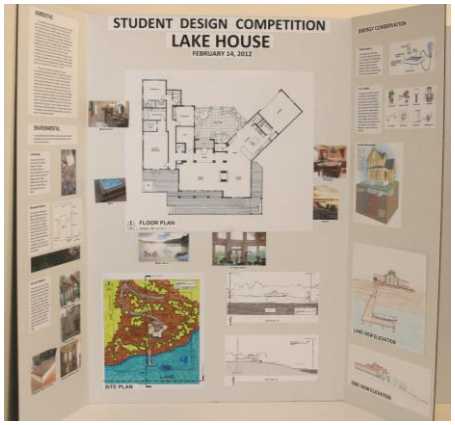
The base is typically made from an approximately 24" x 36" white or black foam board which is available in thicknesses from 1/8" to 1/2". The base could be made thicker by building up the surface with layers of cardboard to create contours representing the slope of the hill

ENVIRONMENTAL FEATURES:

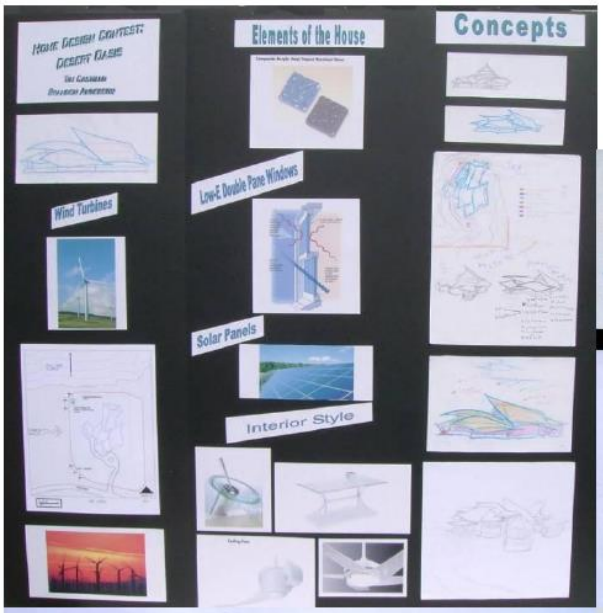
Features	How to Show on Plan
1. Recycled Materials. The best way to reduce the energy used to produce the construction materials and the negative impact waste disposal has on the environment is to re-use more and recycle everything possible. Recycled-content materials such as roofing, gypsum board, siding, and even paint are readily available.	Add notes to the plan: "The project will use materials with recycled."
2. Water Harvesting. It does not rain on mars, but it does snow in the colder seasons. Melted snow water could be captured in a water collection system, which carries water to filtration device before it arrives in a cistern located either above or below ground. The stored water can be pressurized and piped to an irrigation or plumbing system. The cistern can be shown on the floor plan as a 24" circle next to the exterior wall of the settlement.	Use this symbol on the floor plan and label:  Cistern
3. Composting. Composting is the process of speeding up the decaying of organic matter for use as garden soil. The bacteria and fungi that reside in the compost pile or bin devour yard and household organic waste, producing organic fertilizer. All of the waste produced by the colony should be recycled. (Waste that cannot be recycled will be stored until technology is developed that can remove or recycle it.)	Use this symbol on the floor plan and label:  Compost Bin
4. Sun Path. Mars rotates in the same direction as on the Earth. The Sun appears only about two-thirds the size of what it appears from Earth because Mars is farther from the Sun. Some Martian days are capped by a sunset significantly longer and redder than typical on Earth.	Orient the house so that the rooms needing constant light are facing north.
5. Wind Power. On Mars there are fast but thin winds. Scientists are still studying the wind conditions on Mars, but this might be a form of energy production. The wind farm in the San Gorgonio Mountain pass, for example, provides enough electricity for Palm Springs and the entire Coachella Valley. Each of the 4,000 windmills produces 300 kilowatts of power by transforming the kinetic energy of the wind into mechanical or electrical energy. The windmills require an average wind speed of at least 13 mph to operate. The largest stands 150 feet tall, weighs 45,000 pounds, and costs approximately $300,000.	Use this symbol on the floor plan and label:  Windmill
6. Solar photovoltaic panels. Photovoltaic technology is a renewable source of energy where semiconductors convert solar radiation into direct current electricity. Photons of light charge electrons into a higher state of energy allowing them to carry electric current. Solar panels composed of a number of solar cells are typically mounted on the roof of a structure at angle facing south or on the south-facing slope of a roof for best efficiency.	 Solar Panels on the Model can be shown with black film, tin foil or paper

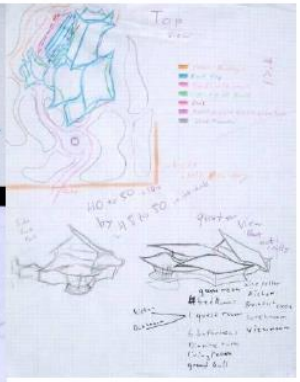
SAMPLE WINNING PROJECTS FROM PREVIOUS CONTESTS

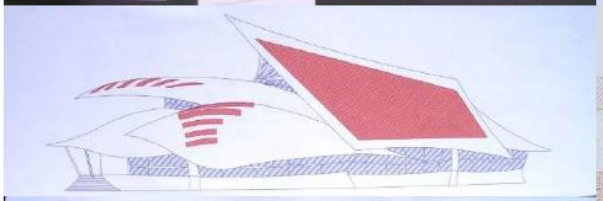
Lake House theme contest 2011 - 2012

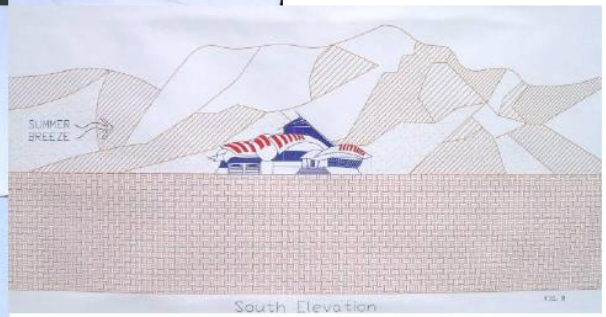


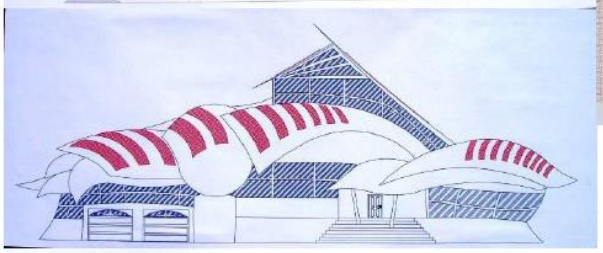
Mountain Theme 2007 - Plateau House

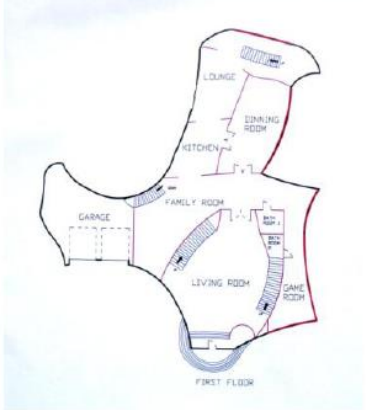


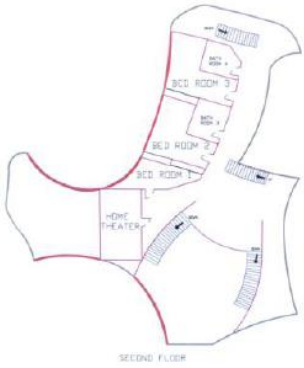


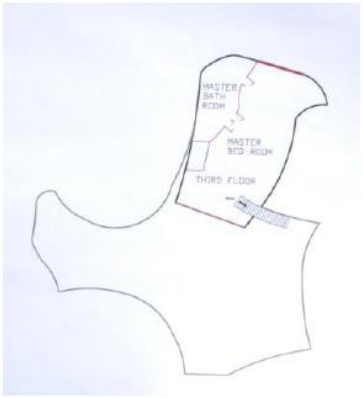












IMAGES

Image 1:

Source: http://www.dezeen.com/2013/01/31/foster-partners-to-3d-print-buildings-on-the-moon/

Image 2:

Source: http://www.dezeen.com/2013/01/31/foster-partners-to-3d-print-buildings-on-the-moon/

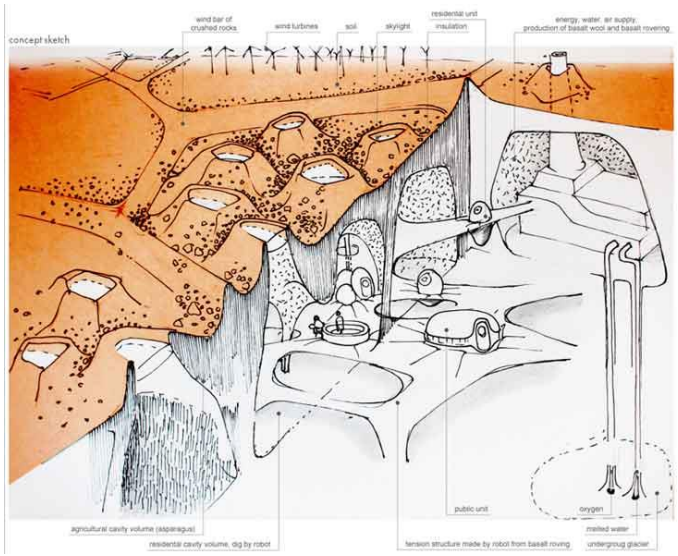
Image 3:

Source: http://www.dezeen.com/2013/01/31/foster-partners-to-3d-print-buildings-on-the-moon/

Image 4:

Source: http://blog.lesliesaul.com/inspiration/innovative-architecture-is-a-3-d-printed-moon-base-possible/

Image 5



Source: http://inhabitat.com/za-architects-propose-an-underground-colony-on-mars/mars2/?extend=1#13811778953501&50822::resize_frame|78-151

Image 6

Source: http://www.space.com/20165-mars-one-colony-images.html

Image 7

Source: http://www.space.com/20165-mars-one-colony-images.html

Image 8

Source: http://www.space.com/20165-mars-one-colony-images.html

Image 9:

Mars – the red planet

Source: http://inspirationmars.org/

Image 10

Source: http://3.bp.blogspot.com/_3wFAe5sLpSQ/S0eHRZPAmMI/AAAAAAAAA9I/n6Cw0-7kRuE/s400/spaceeco.jpg

Image 11

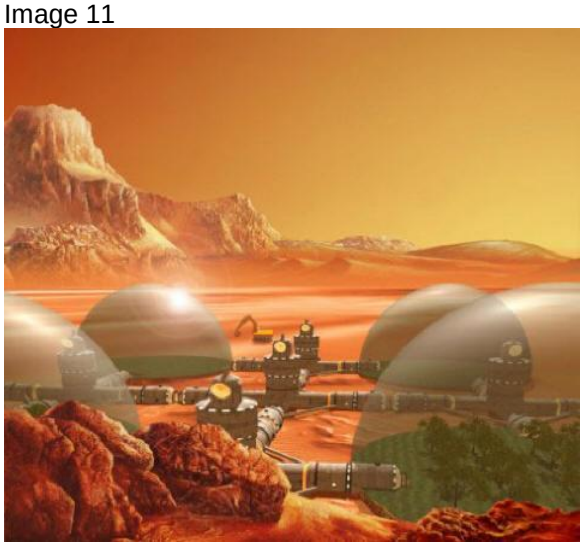


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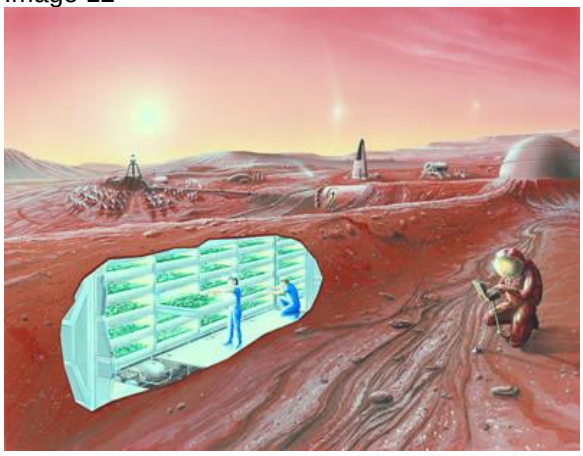
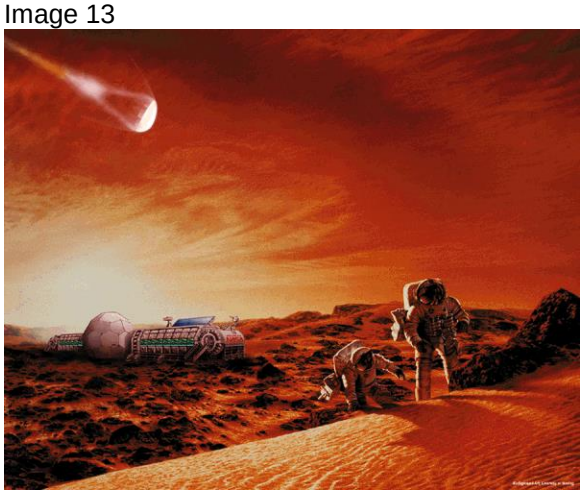
Image 12



Source: http://www.schillerinstitute.org/educ/shakespeare/2012/S_and_metaphor/mars_colonization.jpg

Image 13

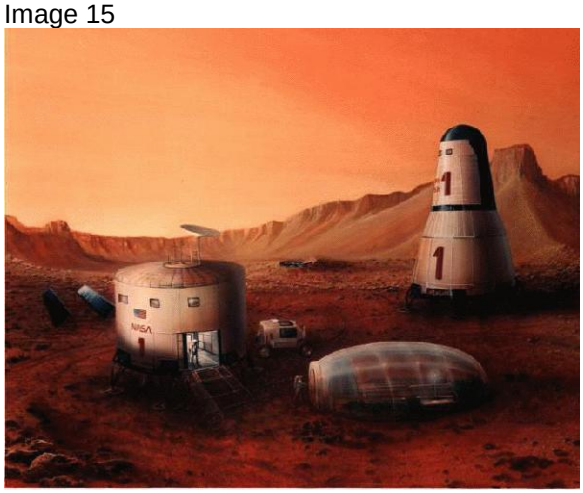


Source: http://4.bp.blogspot.com/-gNitcg7RB40/T9eZpkDX0VI/AAAAAAAADwg/PSsLVBjpu50/s1600/mars.gif

Image 14

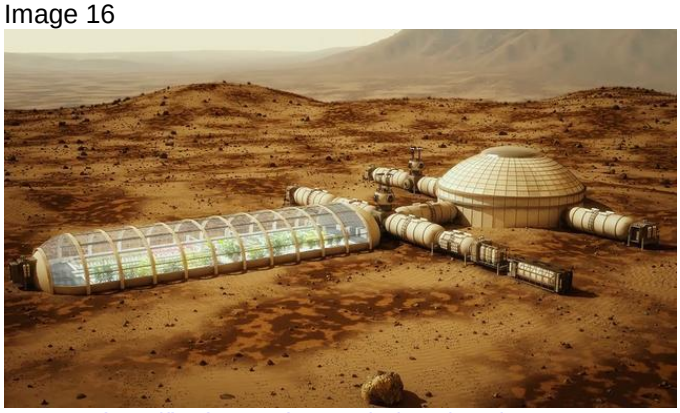
Source: http://www.cosmosfrontier.com/files/future_004.jpg

Image 15



Source: http://www.topsecretwriters.com/wp-content/uploads/2012/07/marsdirect.jpg

Image 16



Source: http://b.vimeocdn.com/ts/326/775/326775161_640.jpg

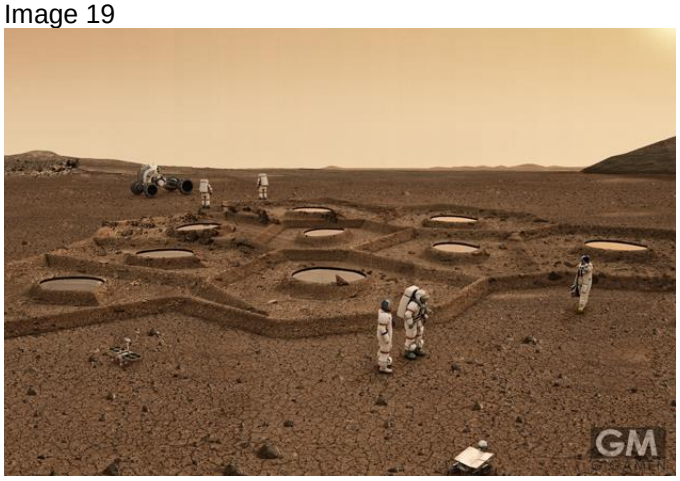
Image 17

Source: http://www.greencupboards.com/blog/wp-content/uploads/2011/03/405_MarsColony02-e1300148270241.jpeg

Image 18

Source: http://www.nss.org/settlement/calendar/2009/MaylockStansbury-MarsColony1-650.jpg

Image 19

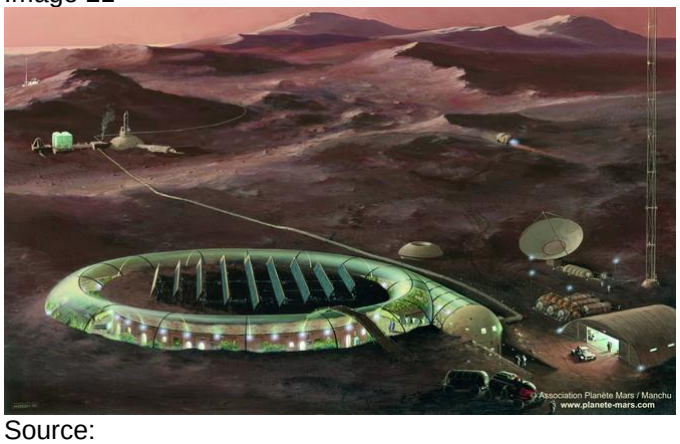


Source: http://www.gigamen.com/wp-content/uploads/2013/09/gigamen_Mars_Colonization.jpg

Image 20

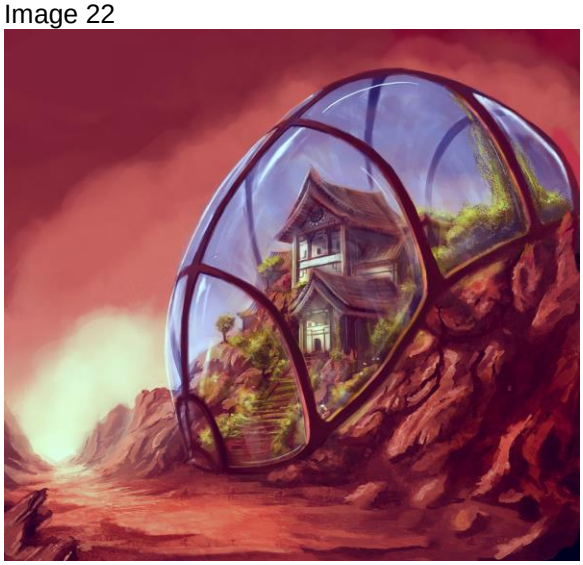
Source: http://www.cosmosfrontier.com/files/phobosbase-650.jpg

Image 21



Source:
http://www.marshome.org/images2/albums/Space%20Stations%20and%20Colonies/Back_to_the_Burrow.jpg

Image 22

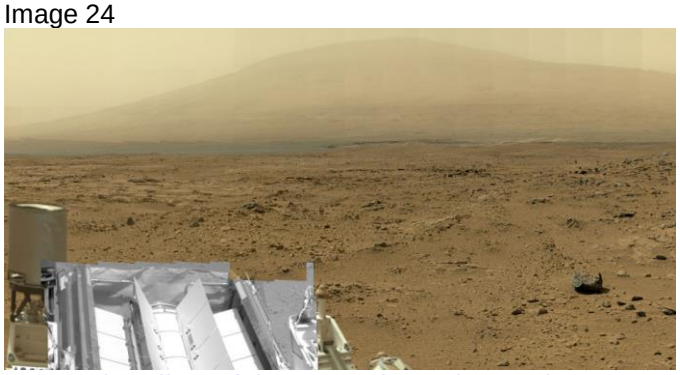


Source: http://fc02.deviantart.net/fs43/f/2009/096/6/f/mars__2580_by_shardanas.jpg

Image 23

Source: http://whewellsghost.files.wordpress.com/2010/10/mars_landscape.jpg

Image 24



Source: http://www.jpl.nasa.gov/spaceimages/

WEB LINKS:

Habitat on the Moon

- http://studio-rothstein-fa12.tumblr.com/
- http://www.arch.columbia.edu/#work/course-blogs-index?&_suid=13805780905400047908068766724376.
- http://spaceplace.nasa.gov/moon-habitat/
- http://metro.co.uk/2006/12/05/nasa-will-build-homes-on-the-moon-415970/
- http://www.dezeen.com/2013/01/31/foster-partners-to-3d-print-buildings-on-the-moon/.
- http://www.fosterandpartners.com/news/foster-+-partners-works-with-european-space-agency-to-3d-print-structures-on-the-moon/
- http://blog.lesliesaul.com/inspiration/innovative-architecture-is-a-3-d-printed-moon-base-possible/. http://www.csupomona.edu/~arc/fox_nasa.html

Habitat on Mars

- http://www.aces.edu/dept/4Haero/NASASpacePlace/MarsF01.pdf.
- http://inhabitat.com/over-200000-people-apply-to-become-first-colonizers-of-mars/#13811767470701&46759::resize_frame|78-151. http://inhabitat.com/project-nomads-mobile-skyscrapers-could-terraform-mars-for-human-colonisation/
- http://www.space.com/20165-mars-one-colony-images.html
- http://www.wired.com/science/discoveries/news/2004/06/63893.
- http://www.marssociety.org/conventions/speakers-bureau.
- http://www.exploremarsnow.org/ http://www.space.com/1419-homestead-project-making-mars-settlement-reality.html http://www.mars-one.com/en/.
- http://www.jpl.nasa.gov/spaceimages/.